



Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences



# Habitat restoration

-why it is good to “fail”

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# Restoration

- Where

Boreal regions of Scandinavia

- What

In-stream habitat

Juvenil brown trout and Atlantic salmon

- How

Boulders

Gravel

LWD

# Background

- Focus on successful projects
- "Failures" not highlighted
- "Failures" a source of knowledge



# Background

- Answers: 14 counties



# Background

- Primary goal  
Benefit salmonids: 75%



# Background

- Evaluation  
Primary goal: 50%



# Background

- Succes

Primary goal: 50-75%





# Background

- Succes

Primary goal: 50-75%

Failure: 25-50%



# Background

- Failure

No further investigations in 60% of failed projects



# Background

- “Failure” or not
  - knowledge about the catchment
  - methods to detect changes
  - time scale of monitoring

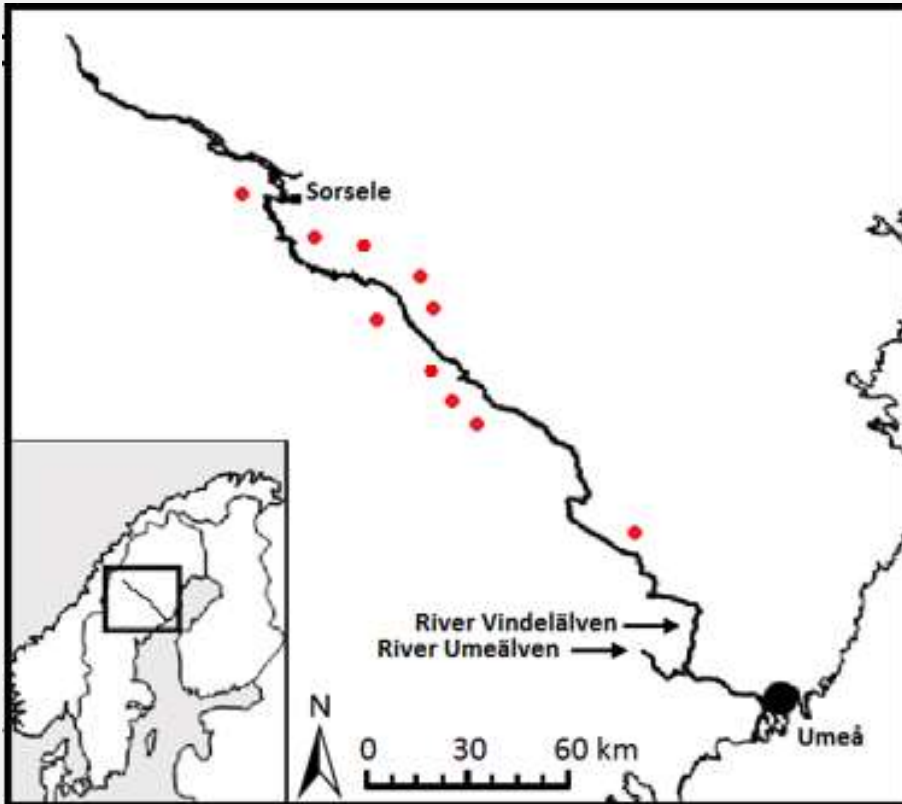
# Background

- “Failure” or not
  - Removing bottlenecks (migration, habitat area/quality)

# VindelriverLIFE.se as an example



# VindelriverLife 2010-2015





# Restoration

Traditionally and enhanced

**Specific goal:**

Increased abundance of brown trout and Atlantic salmon



# Predictions

- Increased abundance  
(detectable by standard electrofishing procedures)
- Response within 5 years

# Assumptions

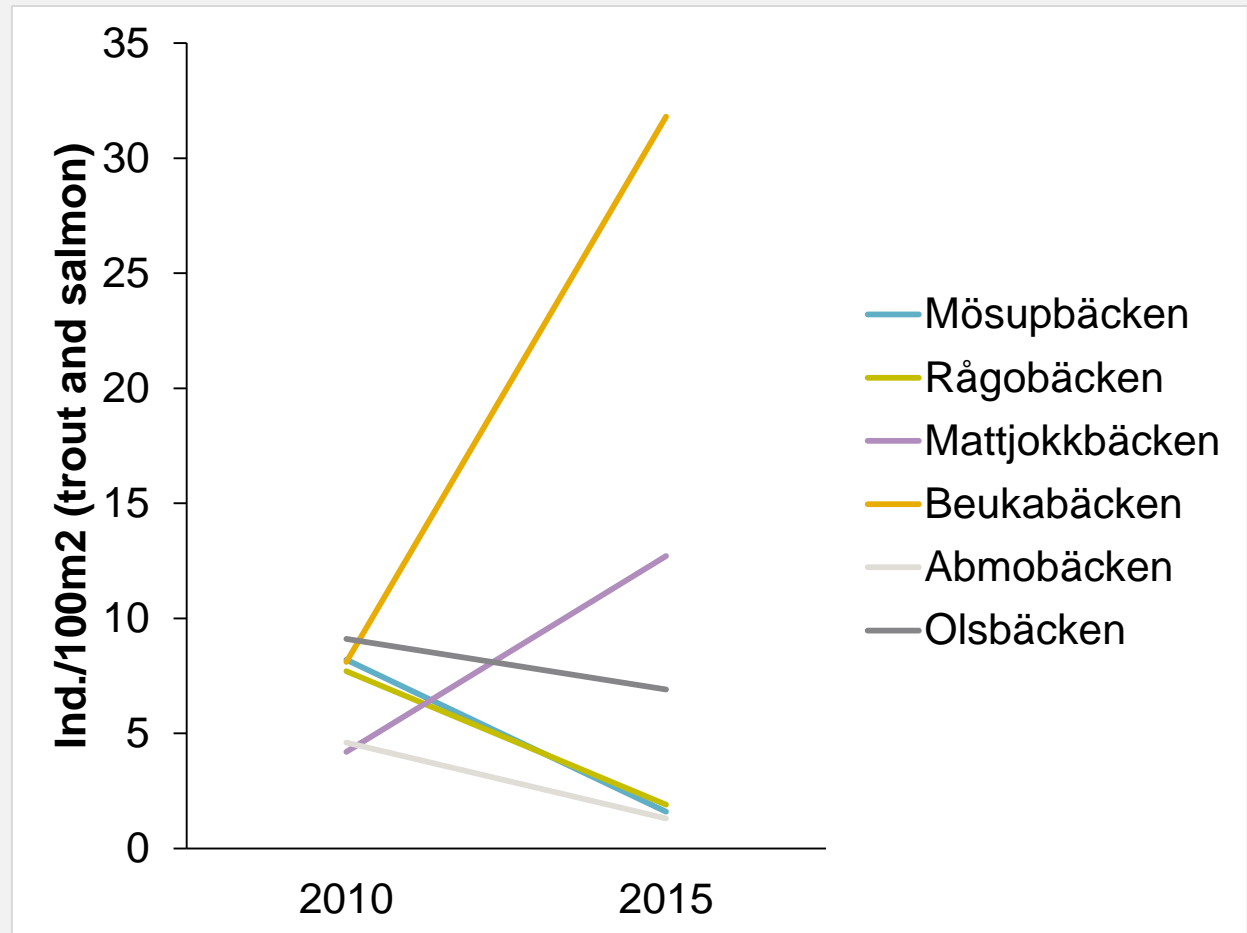
- Recolonisation from nearby source populations
- Similar conditions for biotic production across streams





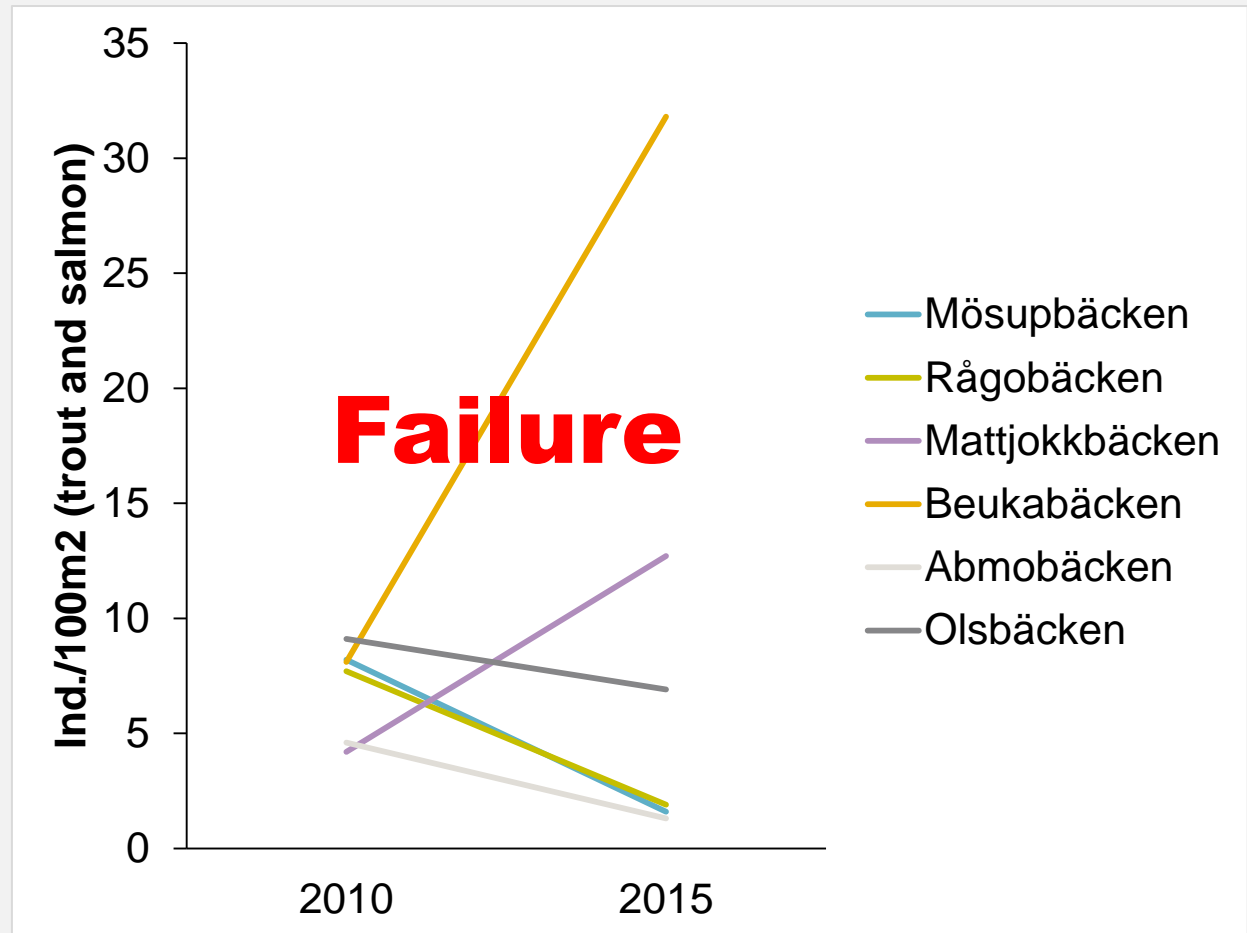
# Abundance

- Results



# Abundance

- Results





[Ecosystems](#)

pp 1–19

# How Do Biota Respond to Additional Physical Restoration of Restored Streams?

Christer Nilsson , Judith M. Sarneel, Daniel Palm, Johanna Gardeström, Francesca Pilotto, Lina E. Polvi, Lovisa Lind, Daniel Holmqvist, Hans Lundqvist

[Open Access](#) | Article

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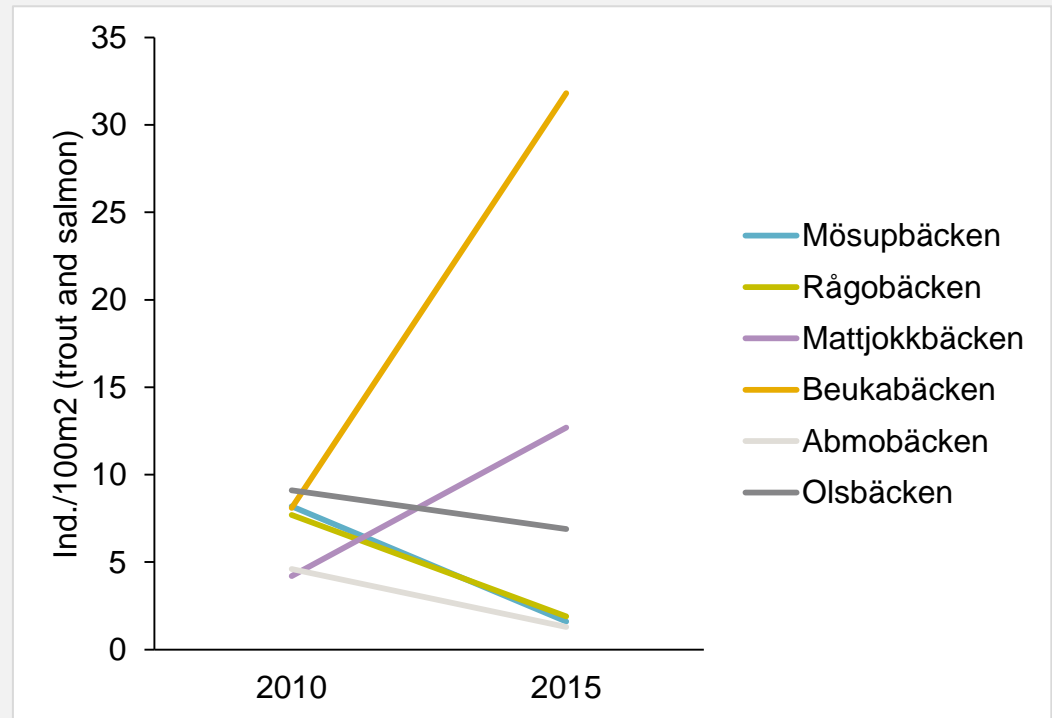
Nilsson, C., Sarneel, J.M., Palm, D. et al.  
Ecosystems (2016). doi:10.1007/s10021-016-0020-0

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Views

# Abundance?

- Location of sampling sites
- Timing of sampling
- Migration



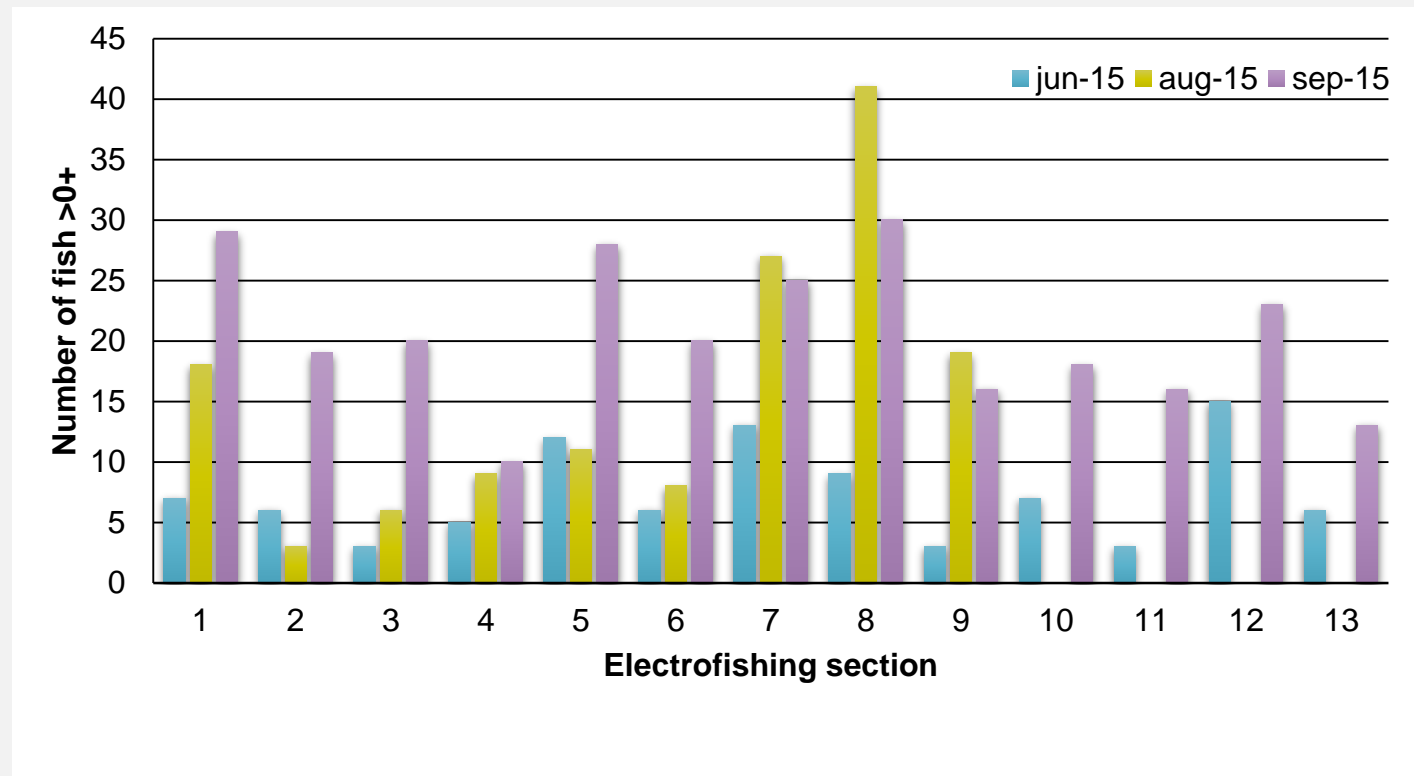
# Abundance?

- Method



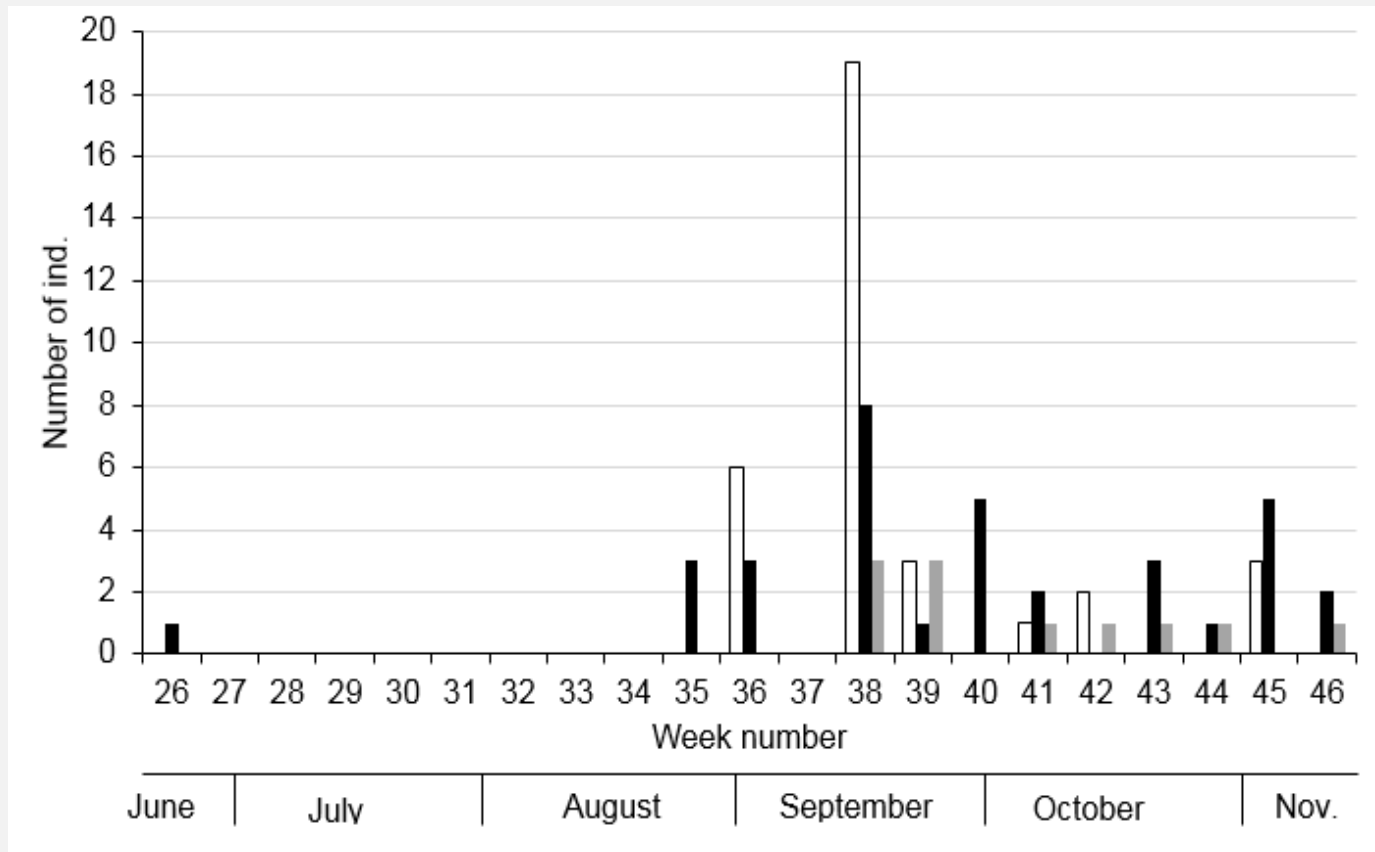
# Abundance?

- Location of sampling sites
- Timing
- Migration



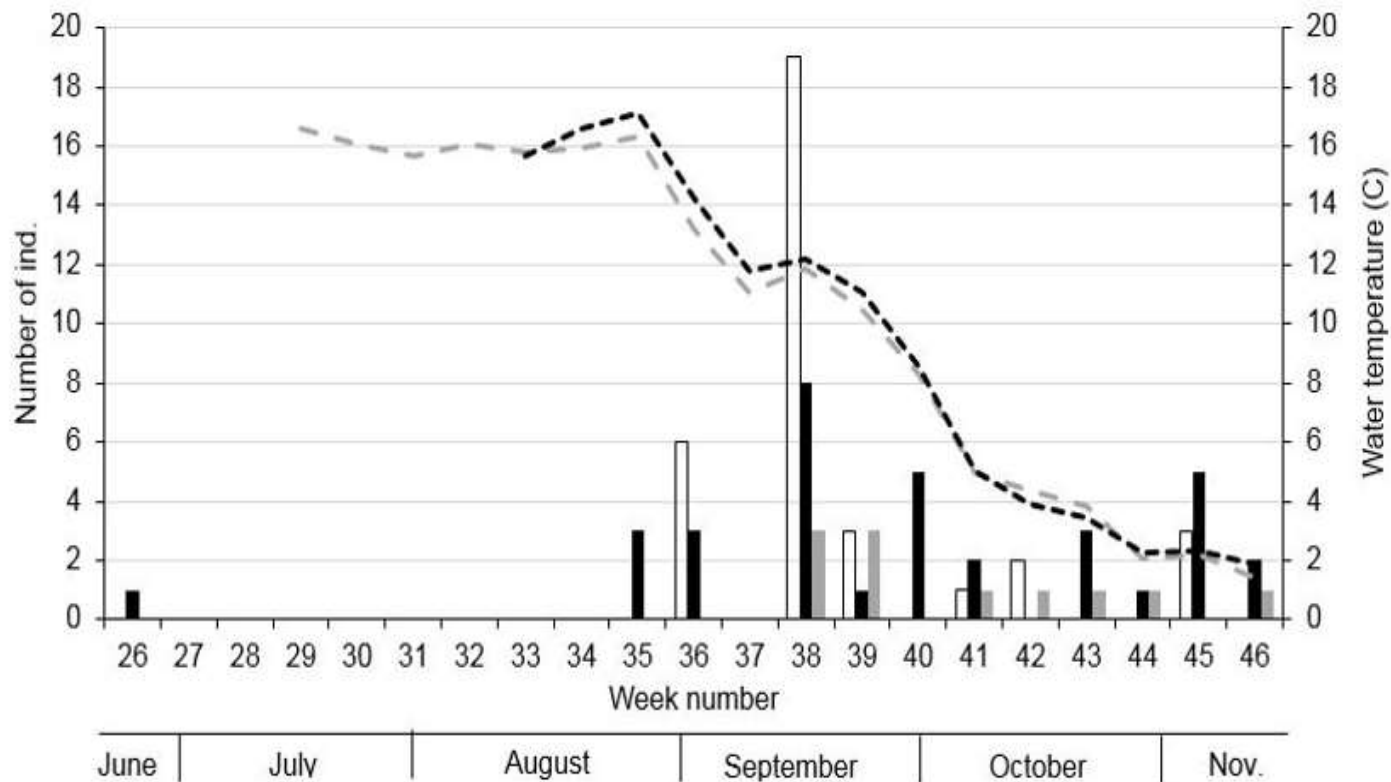
# Abundance?

- Migration
- Timing



# Abundance?

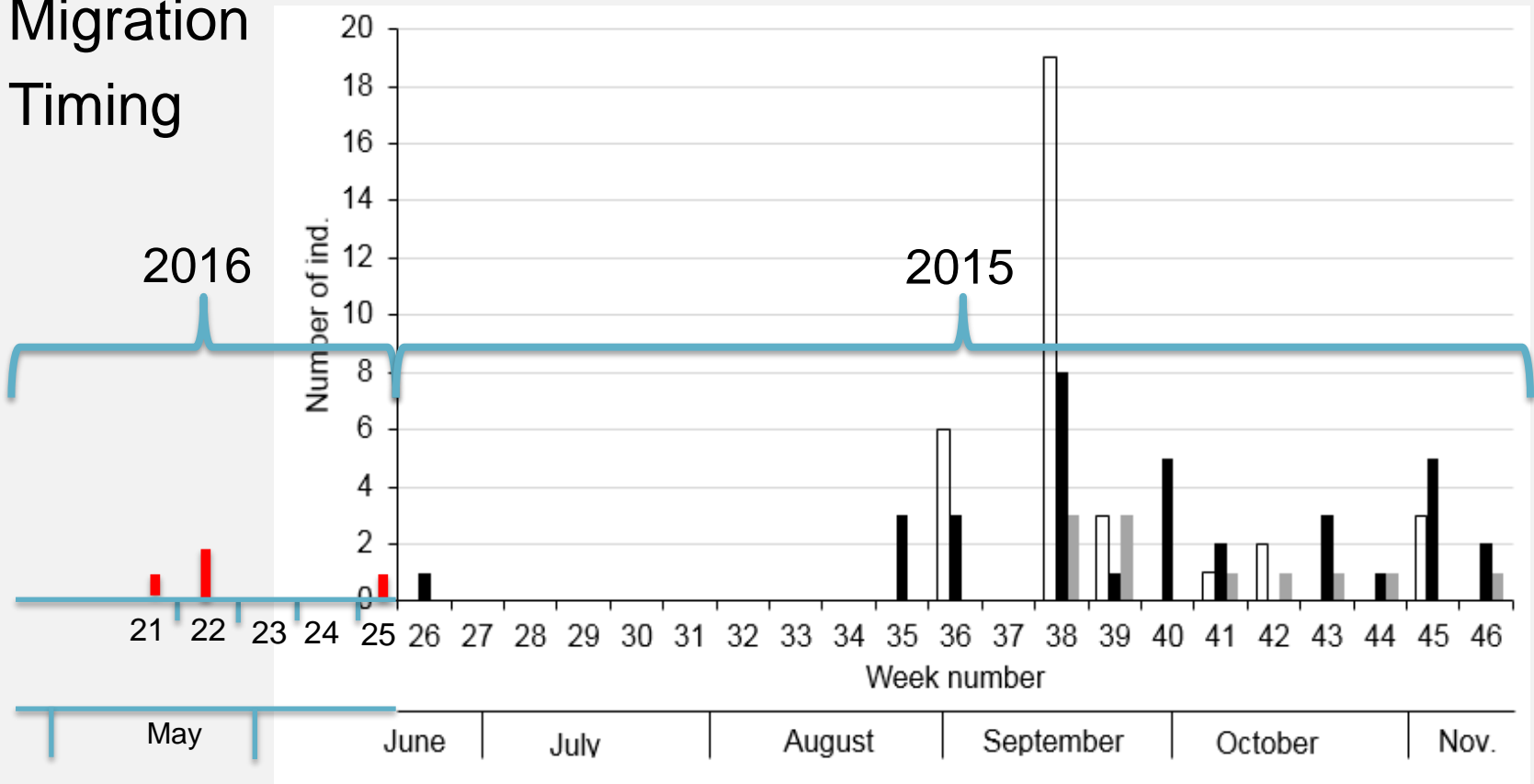
- Migration
- Timing





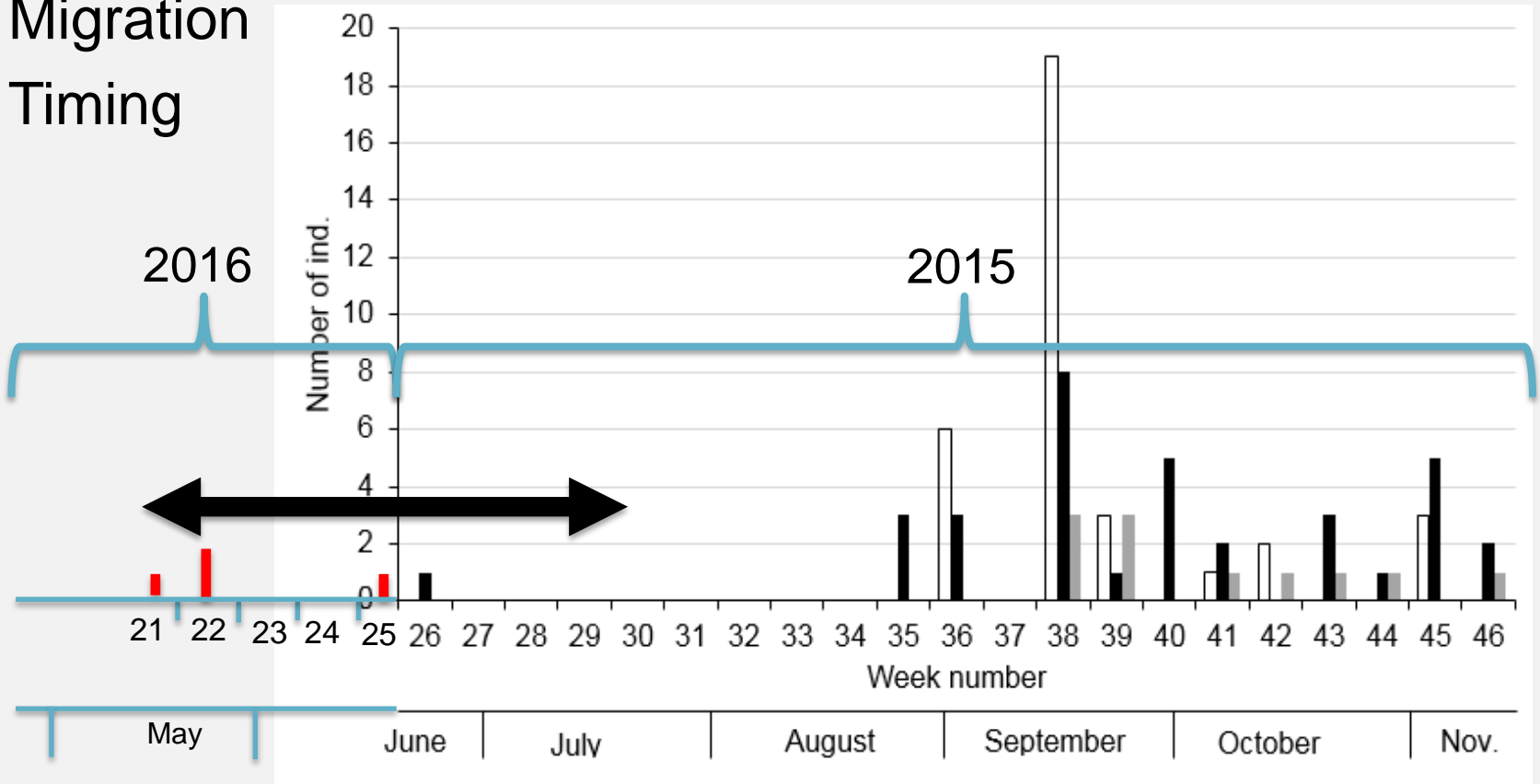
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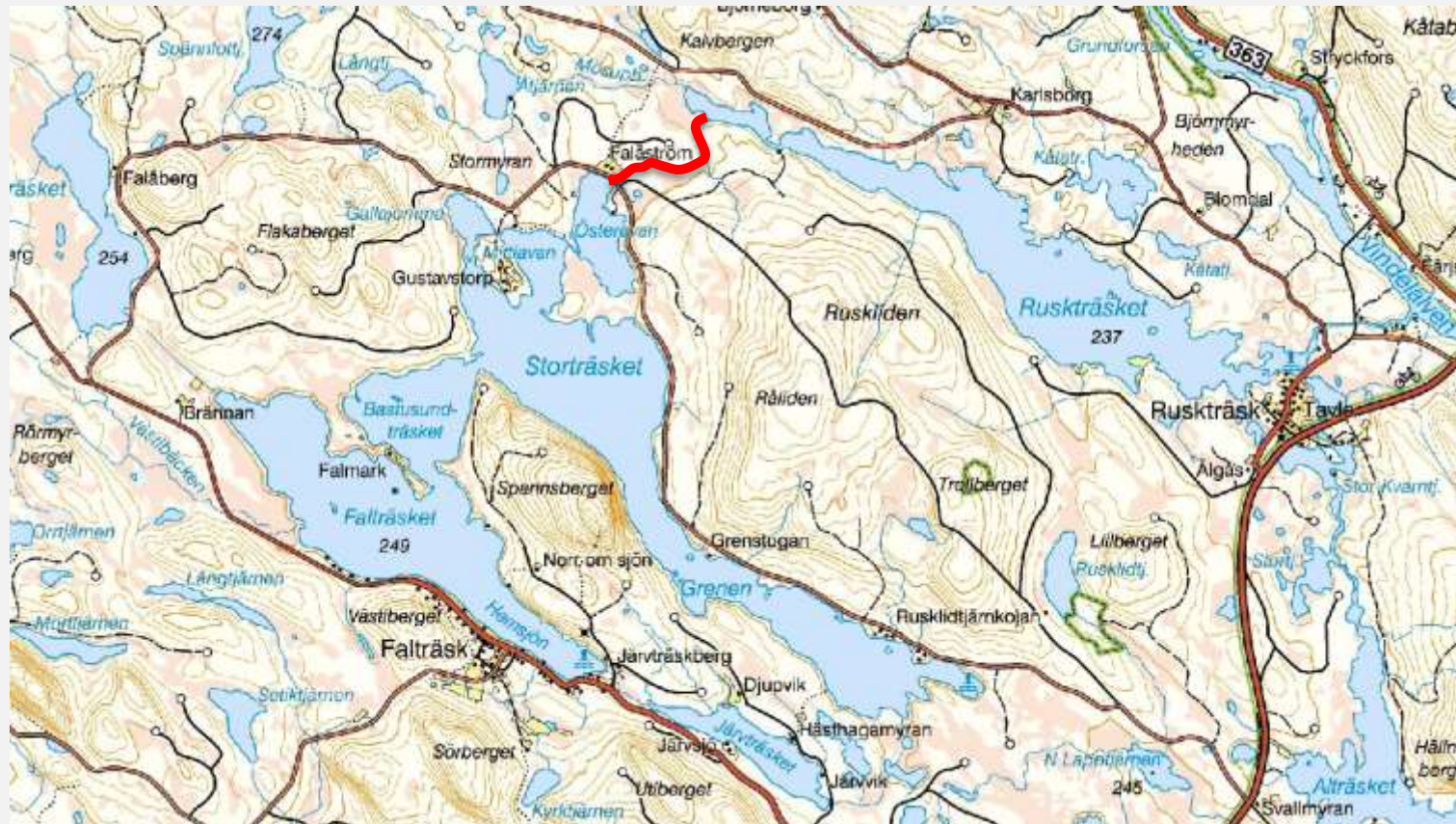


# Abundance?

- Migration
- Timing

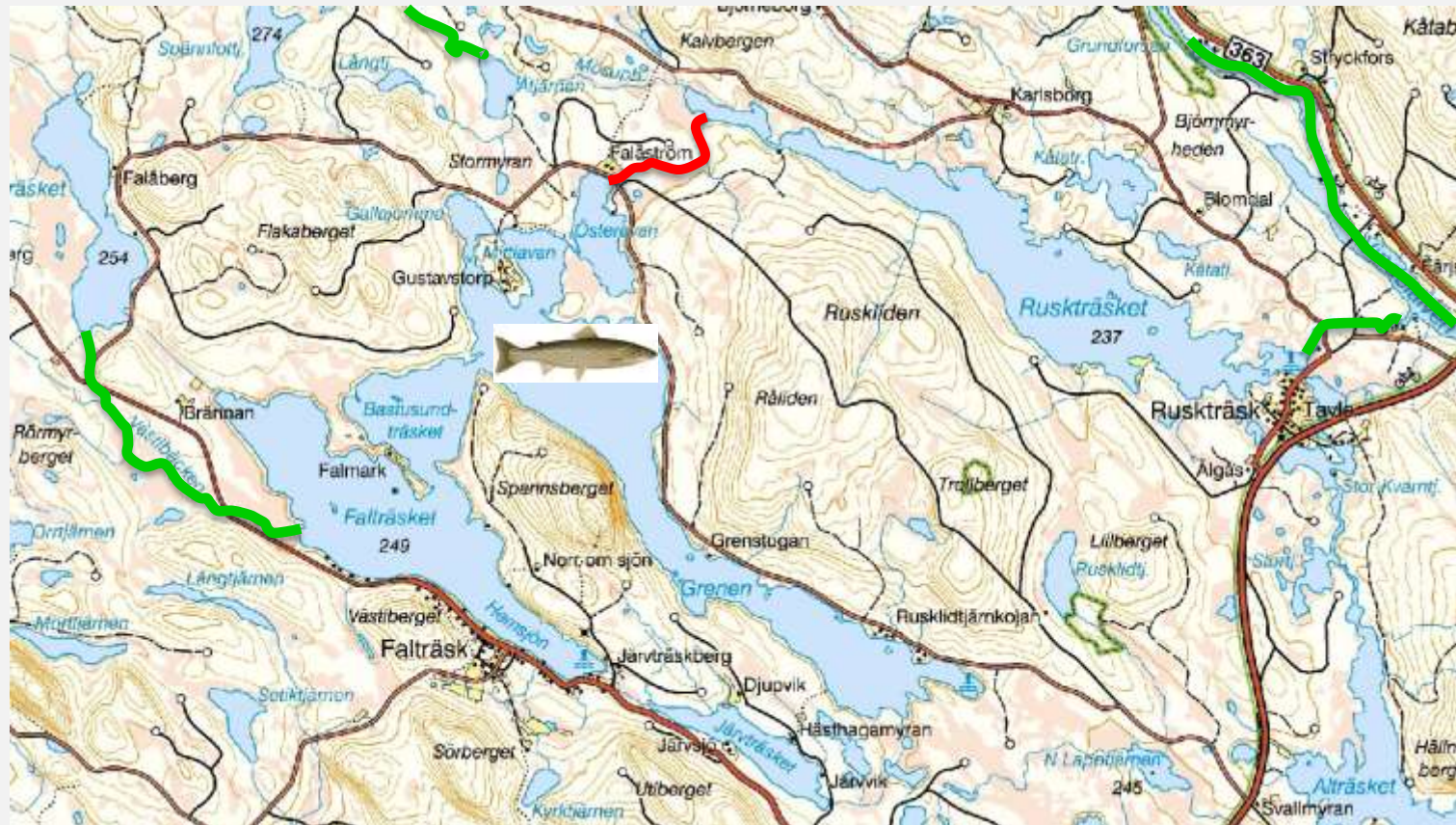


# Recolonisation?





# Recolonisation?



# Recolonisation?



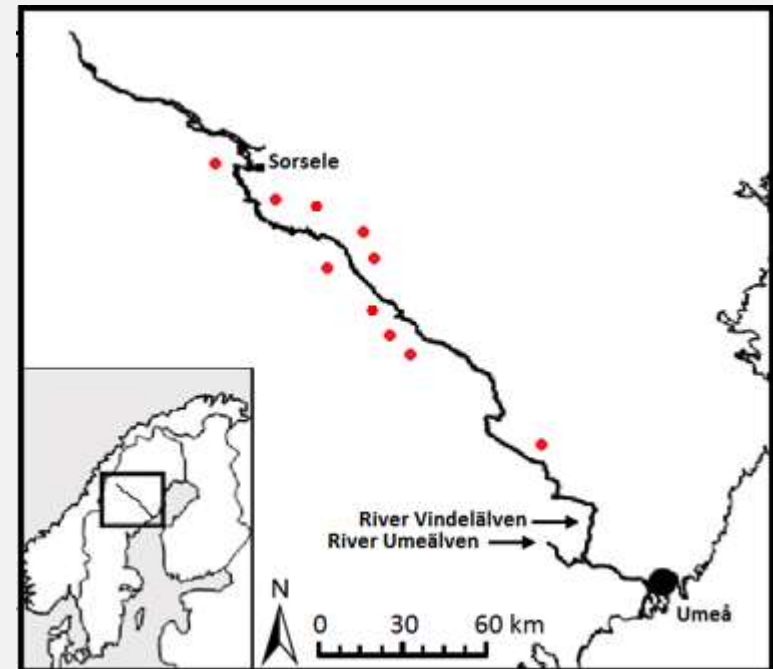


# Recolonisation?

- Artificial recolonisation to verify habitat and water quality



# Similar conditions for biotic production?



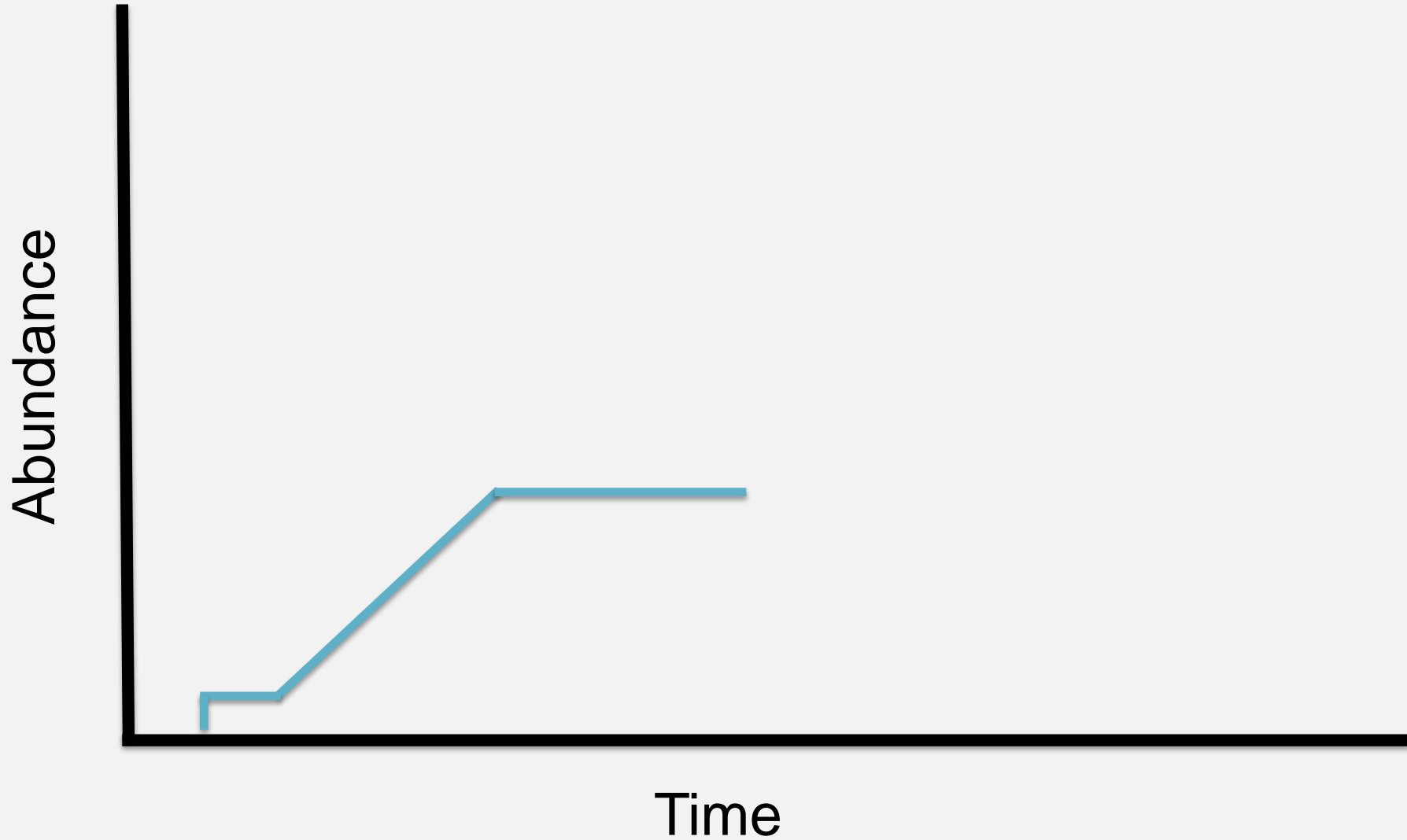




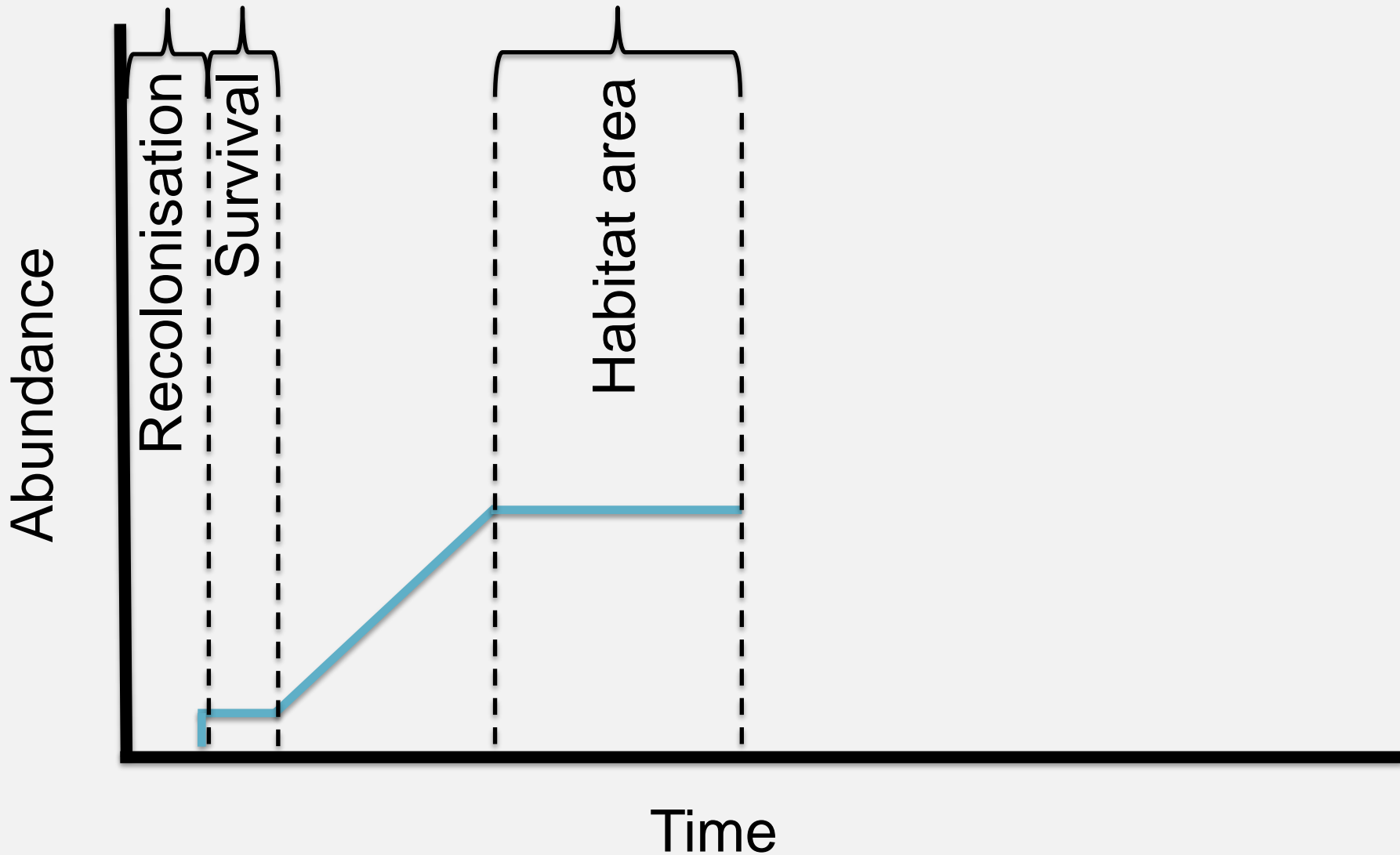
# **Successful restoration = Removing bottlenecks**

- **Bottlenecks varies between tributaries and populations**

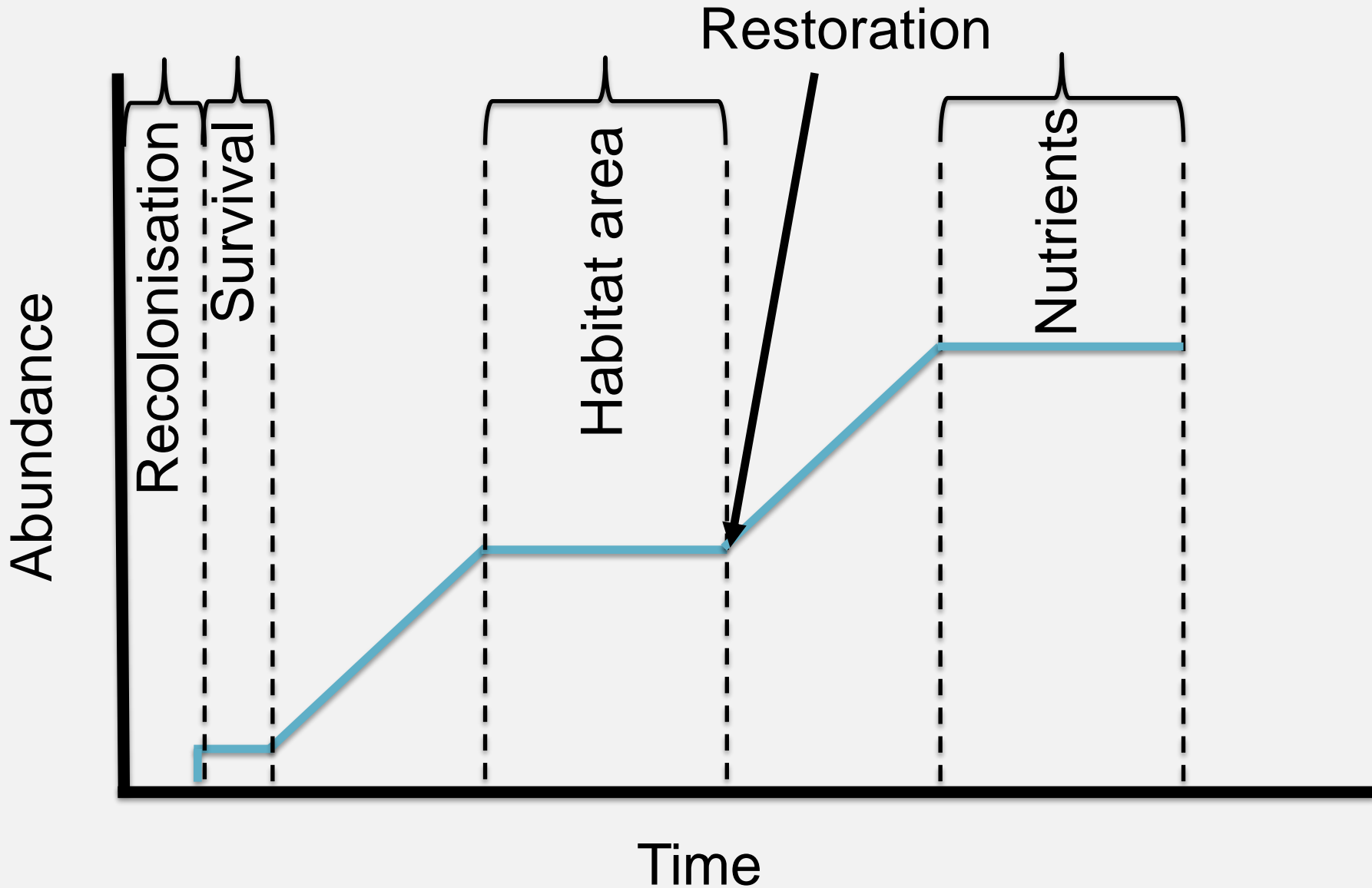
# Bottlenecks and population status



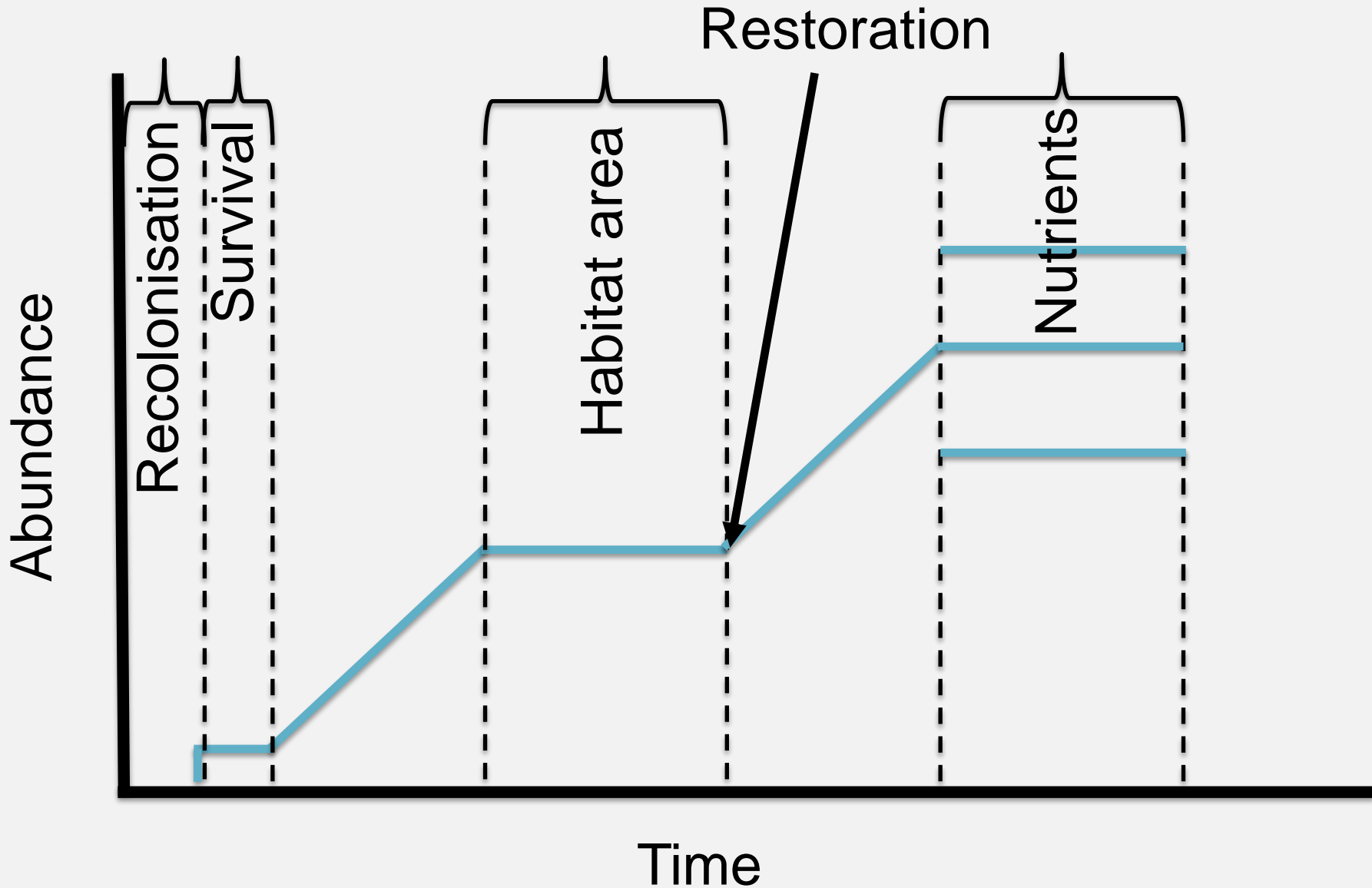
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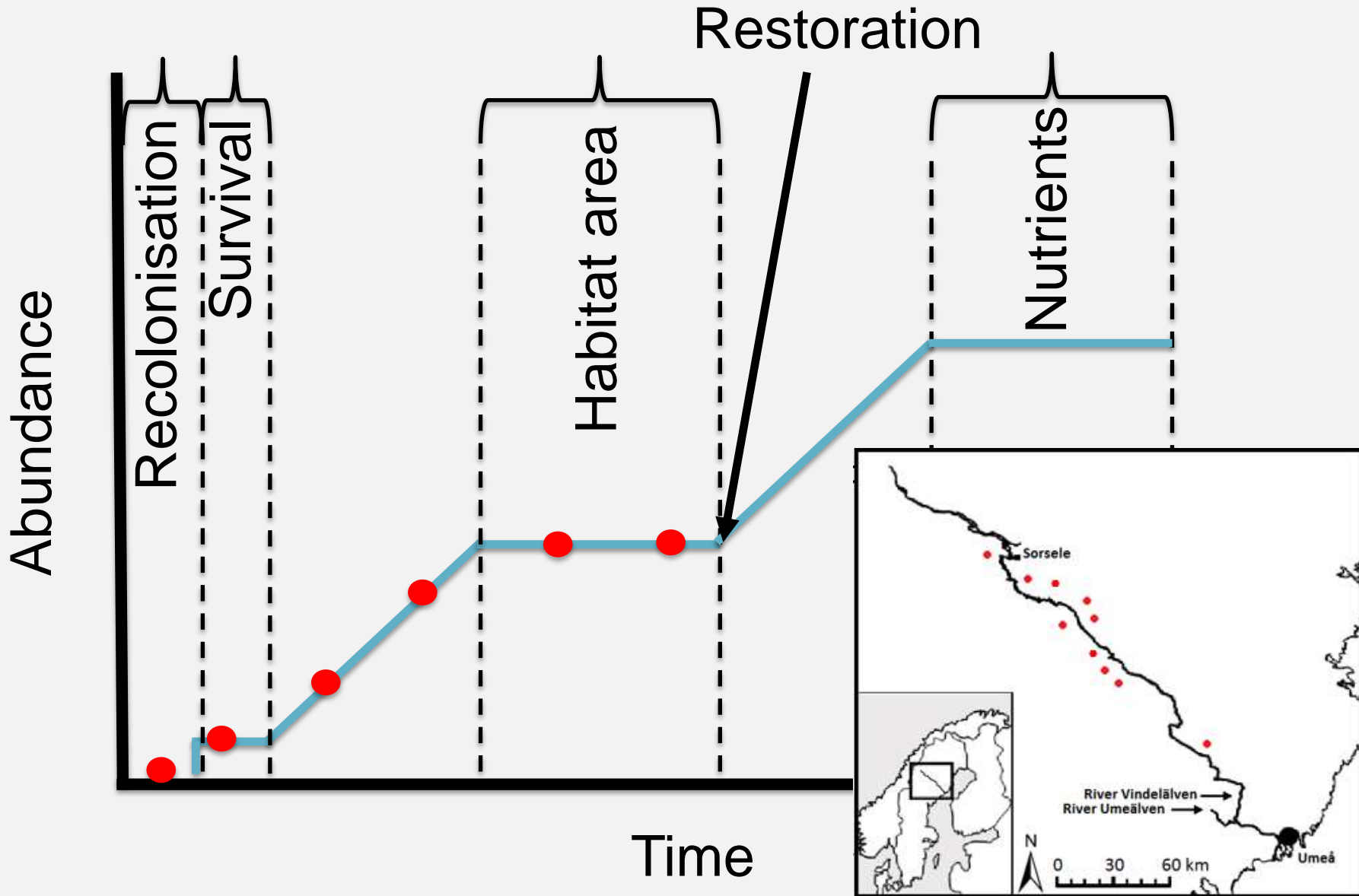
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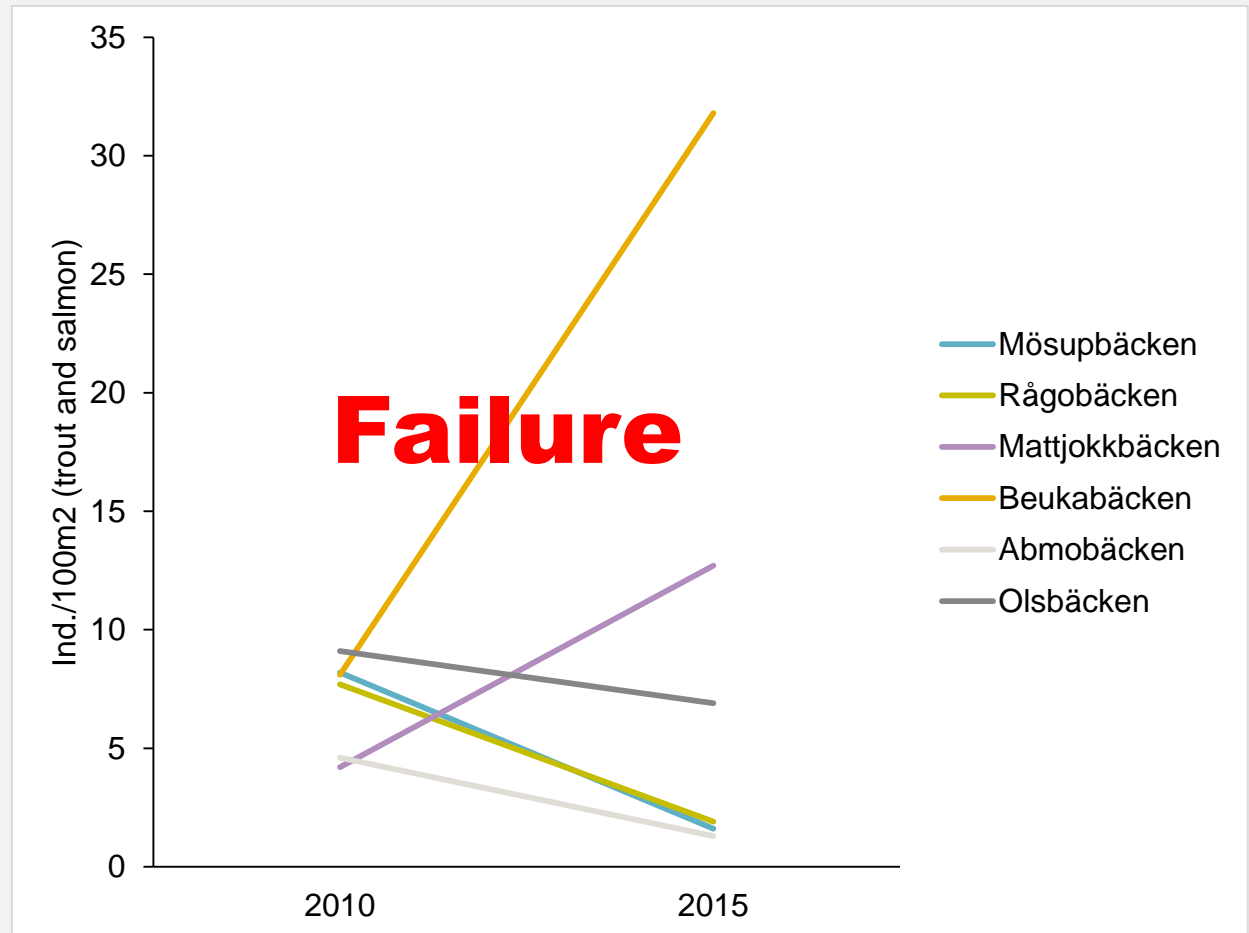


# Bottlenecks and population status



# Abundance

- Results



# Recomendations

- Identify population status
- Identify bottlenecks
- Migration/movement patterns
- Assumptions and predictions – relevant for specific streams
- Apply new methods, in addition to traditional electrofishing, to evaluate



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- Identify population status
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- Assumptions and predictions – relevant for specific streams
- Apply new methods, in addition to traditional electrofishing, to evaluate

**Learn from "failures" !!!!!!!!!!!!!!!**

# Background

Failure: 25-50%





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# Thank you!

## Questions?

